Electronic Supplementary Information (ESI)

Tunable Emission Color and Mixed Valence State via the Modified Activator Site in AlN-Doped Sr3SiO5:Eu Phosphor

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Figure S1. XRD patterns of Sr_{2+y}Si_{1-x}Al_xO_{5-2x}N_x:0.03Eu (x = 0.3 and 0.5), together with the standard data for Sr3SiO5 as reference.

Figure S2. Asymmetry ratio of the emission intensities of Eu^{3+} transitions of ^5D_0→^7F_2 and ^5D_0→^7F_1 as a function of x values.

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**Figure S3.** Detailed XRD patterns from 30° to 31.5° of Sr$_{2.97}$Si$_{1-x}$Al$_x$O$_{5.2}$N$_x$:0.03Eu ($x = 0-0.2$).

**Figure S4.** Decay curves ($\lambda_{ex} = 310$ nm, $\lambda_{em} = 619$ nm) of Eu in Sr$_{2.97}$Si$_{1-x}$Al$_x$O$_{5.2}$N$_x$:0.03Eu ($x = 0.03$, $0.05$, $0.1$ and $0.2$).

**Figure S5.** PL ($\lambda_{ex} = 310$ nm) spectra of Sr$_{2.97}$Si$_{1-x}$Al$_x$O$_{5.2}$N$_x$:0.03Eu ($x = 0.02$) under various temperatures (300-460 K).